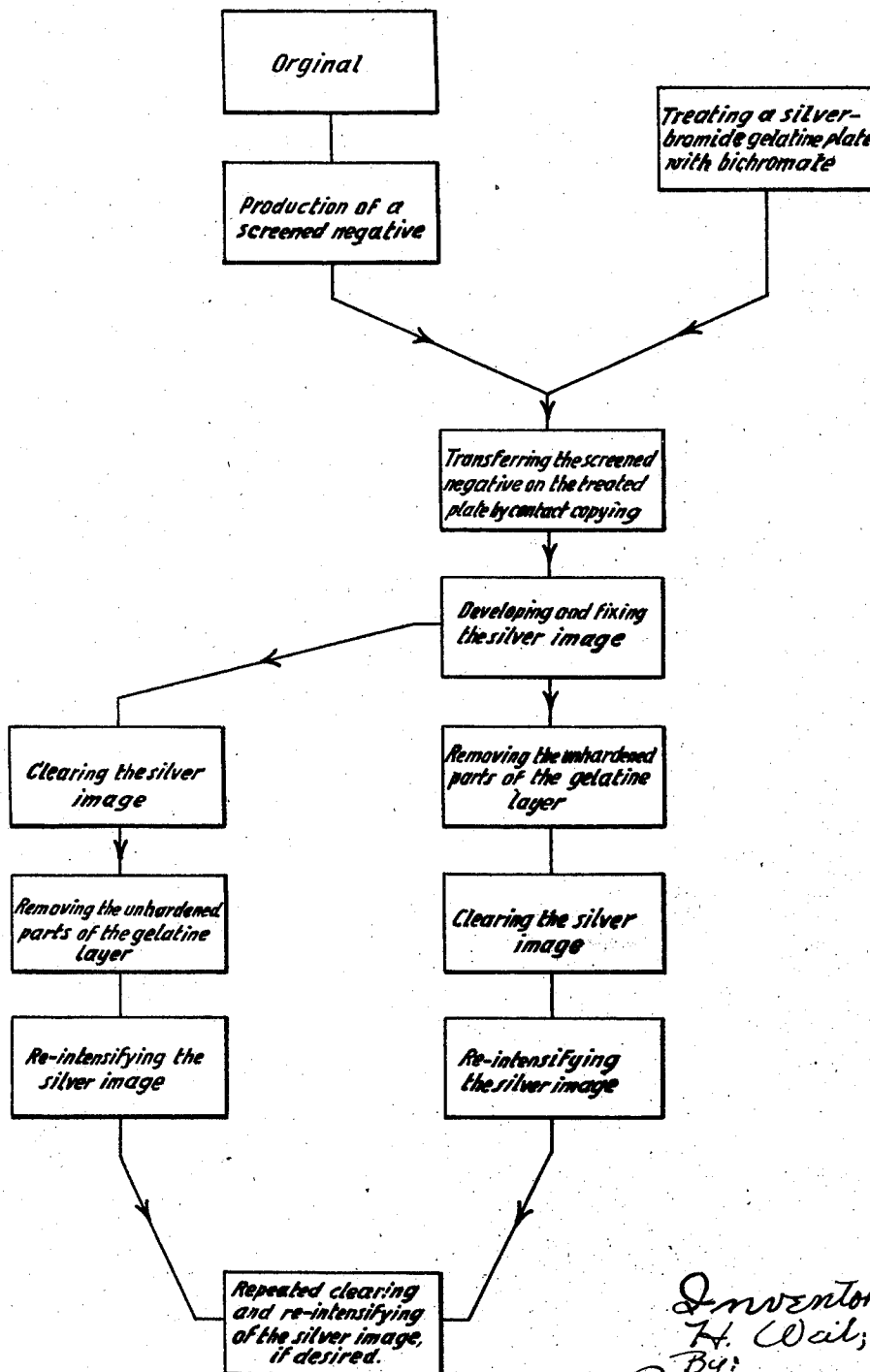


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PROCESS FOR THE PHOTOCHEMICAL PRODUCTION OF FORMS
OR PATTERNS FOR PLANOGRAPHIC PRINTING
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PROCESS FOR THE PHOTOCHEMICAL PRODUCTION OF FORMS OR PATTERNS FOR PLANOGRAPHIC PRINTING

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It is known, that in the production for planographic printing of forms or patterns which are capable to be copied, it is a difficult matter to obtain upon the screened form or pattern the accurately correct and desired tone values. It is known how to attain upon the screened negative or diapositive a reduction of the dots, but it was impossible till now to bring about a real enlargement of such dots which have once been reduced in scope.

The present invention is illustrated by the single figure of the drawing which is a flow sheet showing the steps of the process, which is more fully described below.

The present invention relates to a process, which also renders it possible to attain such a real enlargement of dots. The essential feature of the new process consists in the fact, that a negative is produced by means of a screen immediately from the original, and that this negative is subsequently transferred to a base or plate by contact copying, said base or plate being provided with a layer which is not only capable of being blackened, but also of being hardened by exposure to the light. For instance a layer of bromide of silver gelatine may be used for this purpose, which has been treated in a bichromate bath or the like prior to the exposure. The metal image then is developed first and fixed in accordance with the usual methods, i. e. with the aid of photographic developers, such as glycine (p-oxyphenyl glycine) or the like as developer, and a solution of alkali thiosulphate for fixing purposes, whereupon, also in accordance with methods known per se, e. g. by means of the so-called Farmer's reducing agent (a dissolved mixture of potassium ferrieyanide and sodium thiosulphate) the reduction of dots which may be required is undertaken. If it is also desired, to effect a real enlargement of dots, the chromate-gelatine image, after developing and fixing the metal image and, if necessary, after etching the latter, is developed in the usual manner. An enlargement of dots then may for instance be effected with the aid of lead intensifiers, e. g. a solution of lead-nitrate and ferrieyanide in water, said enlargement being possible up to the original size of the dots of the screened negative.

The peculiarity of the new process, therefore, is to be found in the fact, that the contact copy is produced with the aid of a layer, capable of being blackened, as well as hardened by light, with the result that, if the metal image, as well as the chromogelatine image are developed and fixed, the latter will retain permanently and un-

changed the original tone values, no matter whether a reduction of the dots of the metal image is performed or even their complete removal. It will thus be possible, and perfectly free from any risk whatsoever, to undertake in the first instance a reduction of dots of any desired intensity in the metal image and nevertheless to be in a position, subsequently to intensify these dots again with the aid of suitable intensifiers until said dots will have reassumed their original size, because this size of the dots has been retained by the chromate gelatine image. It will, however, not be necessary, to develop the chromate gelatine image by washing away the unexposed, unhardened areas of the gelatine layer in all cases, and especially prior to undertaking the reduction of the dots in the metal image, but the development of the chromate gelatine image requires to be undertaken only when and if an enlargement of dots is required.

At the same time the new process embodies the possibility of repeatedly undertaking the reduction of dots, as well as their intensification. If, for instance, the first etching for the purpose of reducing the dots has proved excessive, an intensification of the dots is undertaken, if necessary up to the original size of dots, whereupon certain dots may be reduced again and, if this reduction has gone too far, an enlargement of the dots may be effected again with the aid of suitable intensifiers, and so on.

If a real enlargement of dots in the above mentioned sense is not intended but only an intensifying of the coating, eventually after previous reduction of dots, which intensifying of the coating is in no way identical with the real enlargement of dots, such intensification may be effected even without the necessity of previously developing and fixing the chromate gelatine image. To this end for instance the well-known mercury or copper intensifiers may also be made use of, e. g. an approximate 3% sublimate solution or a solution containing up to 5% copper nitrate. The blackening may then take place in the usual manner, e. g. when employing the mercury intensifier by means of reduction agents, ammonia or the like. With the aid of mercury or copper intensifiers an intensification of the coating may also be performed after the development of the chromate colloid image, but not an actual enlargement of dots in the sense as referred to above. For this purpose a very much stronger intensifier is required, such as especially the lead intensifier.

On the other hand, it will likewise be possible

to work with lead intensifiers, such as those referred to above, if it is intended not to essentially enlarge dots, but merely to intensify the coating.

- In this case also the chromate colloid image does not require to be developed, but the lead intensifier may be made use of in the otherwise usual way after bathing the plate bearing the developed silver image in glycerine (e. g. a solution of 1 part of glycerine in 5 parts of water). Said kind of working with the lead intensifier was impossible so far when working with dry plates but is usual when working with silver bromide-collodium emulsions, by treating with diluted muriatic acid the plate which was previously subjected to the influence of the lead intensifier, watering it and subsequently effecting the blackening by fixing the lead with a solution of alkali sulphide.

- The layer of gelatine or the like, provided with the sensitized layer of metallic salts and treated in the bichromate bath, being made use of for the purpose of producing the contact copy in accordance with the present invention, differs with respect to its properties in regard to exposure essentially from an ordinary sensitized metallic salt gelatine layer, e. g. a silver bromide gelatine layer. For example, whilst an ordinary layer of silver bromide for producing a contact copy requires an exposure to the light of an ordinary incandescent globe of a few seconds only, the silver bromide gelatine bathed in bichromate will exhibit no changes after 10 seconds exposure to the light of the same globe. Only after having been exposed to the light of an arc lamp for a period of half a minute, a useful image will be obtained. The chrome-gelatine, however, even then has not yet become sufficiently hardened. Only after an exposure of some 3 minutes below the arc lamp the chrome gelatine will have assumed the necessary degree of hardness. It is a surprising fact in connection herewith, that the silver image is not over-exposed even after such an extended exposure to a powerful source of light, and that even after 4 minutes no over-exposure of the silver image is to be observed. It is, therefore, obvious, that the chrome gelatine may be hardened by exposure up to any desired degree without running the risk of over-exposing the silver-image and rendering it useless thereby. It will not require any further explanation, that an exposure of such duration would be perfectly out of the question for the production of an ordinary brome silver image.

- It is, furthermore, worthy of notice, that by the fixation of the metal image in the ordinary way the fixing of the bichromate image is not caused simultaneously, or, in other words, that those parts of the chrome-gelatine material not necessary for the etching and subsequent copying process, will not be removed by the ordinary developers. For obtaining this result, it is necessary to treat the image with a suitable solvent, such as warm water, or the like.

- The production of the plates and the like to be used for the new process is suitably effected in such manner, that a plate or film or the like coated in the usual manner with a layer of silver bromide gelatine, is subsequently bathed in a bi-chromate solution, e. g. such of 5-7.5% contents. Upon being exposed to the source of light the silver image and the chrome gelatine image will then be produced in the same layer.

- Having now particularly described and ascertained the nature of my said invention, I declare that what I claim is:—

1. A process for the photochemical production on a transparent surface of patterns capable of being copied for planographic printing, consisting in preparing a light sensitive surface layer which by exposure to light will not only be blackened but at the same time also hardened, producing a negative of the original by means of a screen, then transferring this screened negative by way of contact copying on the said surface light sensitive in a double sense, hereafter developing and fixing the blackened metal image and reducing the dots of said metal image in size, if desired, by methods known in themselves for this purpose.

2. A process for the photochemical production on a transparent surface of patterns capable of being copied for planographic printing, consisting in preparing a light sensitive surface layer which by exposure to light will not only be blackened but at the same time also hardened, producing a negative of the original by means of a screen, then transferring this screened negative by way of contact copying on the said surface light sensitive in a double sense, hereafter developing and fixing the blackened metal image and reducing the dots of said metal image in size, said dots afterwards being re-intensified.

3. A process for the photochemical production on a transparent surface of patterns capable of being copied for planographic printing, consisting in treating a surface covered with a layer of silver bromide gelatine before its exposure with an alkali bichromate solution, producing a negative of the original by means of a screen, then transferring this screened negative by way of contact copying on the said treated surface and hereafter developing and fixing the blackened metal image and reducing the dots of said metal image in size, if desired, by methods known in themselves for this purpose.

4. A process for the photochemical production on a transparent surface of patterns capable of being copied for planographic printing, consisting in treating a surface covered with a layer of silver bromide gelatine before its exposure with an alkali bichromate solution, producing a negative of the original by means of a screen, then transferring this screened negative by way of contact copying on the said treated surface, light sensitive in a double sense, hereafter developing and fixing the blackened metal image and then developing the chromate image too.

5. A process for the photochemical production on a transparent surface of patterns capable of being copied for planographic printing, consisting in preparing a light sensitive surface layer which by exposure to light will not only be blackened but at the same time also hardened, producing a negative of the original by means of a screen, then transferring this screened negative by way of contact copying on the said light sensitive surface, hereafter developing and fixing the blackened metal image and then developing the hardened image, the dots of said metal image being reduced in size by methods known per se and afterwards enlarged again, by known means, up to the size of the dots of the hardened image, if desired.

6. A process for the photochemical production on a transparent surface of patterns capable of being copied for planographic printing, consisting in preparing a light sensitive surface layer which by exposure to light will not only be blackened but at the same time also hardened, producing a negative of the original by means of a screen, if

- then transferring this screened negative by way of contact copying on said light sensitive surface, making the exposure of said sensitive layer to light during so long a period that the
- 5 hardening of the exposed layer will have reached the desired measure, hereafter developing and fixing the blackened metal image and reducing the dots of said metal image in size, if desired, by methods known in themselves for this purpose.
- 10 7. A process for photochemically producing patterns on a transparent surface for copying for planographic printing, comprising treating a surface covered with a layer of silver bromide
- 15 gelatine before its exposure with a bichromate solution, transferring a screened negative by means of contact-copying onto the said treated-surface, thereafter developing and fixing the blackened-metal image, and then developing the chromate image.
- 20 8. A process for photochemically producing patterns on a transparent surface for copying a planographic printing, comprising treating a surface covered with a layer of silver bromide gelatine before its exposure with a bichromate
- solution, transferring a screened negative by means of contact-copying onto the said treated-surface, thereafter developing and fixing the blackened-metal image, clearing said metal image, then developing the chromate image, and
- 80 finally re-intensifying said metal image.
9. A process for the photochemical production on a transparent surface of patterns capable of being copied for planographic printing, consisting in preparing a light-sensitive surface layer
- 85 which by exposure to light will not only be blackened but at the same time also hardened, producing a negative of the original by means of a screen, then transferring this screened negative by way of contact copying onto the said
- 90 light-sensitive surface, thereafter developing and fixing the blackened metal image, reducing the dots of said metal image in size, washing away the unexposed unhardened areas of the bichromated gelatine, and thereafter enlarging
- 95 again the dots of said metal image up to the size of the dots of the hardened image.
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